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Tipula abdominalis.
(End of Larva.)

SEPTEMBER, 1902.

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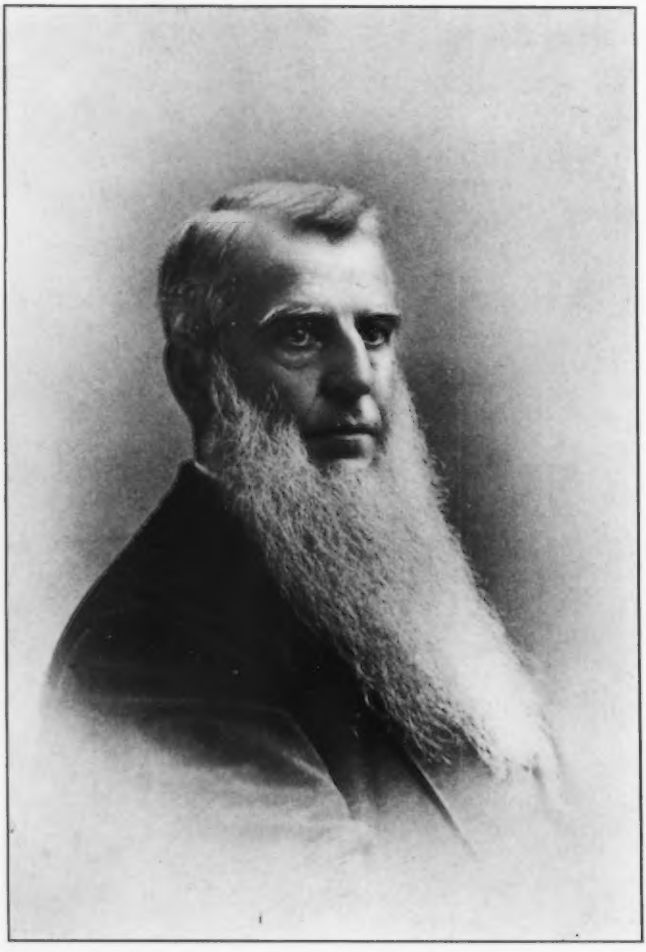

HOMER FRANKLIN BASSETT.

ENTOMOLOGICAL NEWS

AND

PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

ACADEMY OF NATURAL SCIENCES, PHILADELPHIA.

VOL. XIII. SEPTEMBER, 1902. NO. 7.

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OBITUARY.

Homer Franklin Bassett died at his home 120 Cooke Street, Waterbury, Conn., 4.20 A.M., June 28th. He was afflicted with disease of the heart and kidneys.

"Mr. Bassett was the eldest son of Ezra and Keziah Bassett; he was born in Florida, Mass., September 2, 1826. At an early age his parents removed to the Middle West, and he studied at Berea (Ohio) University and at Oberlin College. From 1837 to 1850 he resided at Rockport, Ohio, and from 1850 to 1858 spent his winters teaching in Ohio and Connecticut, returning for the summer months to his farm at Rockport. He taught during the winters of 1851, '52, '53 in Wolcott; in '56 and '57 at Berea, and in '58 and '59 in Waterbury. It was thus that he first became identified with Waterbury and its interests. He spent part of the year 1858 in Kansas, but in the spring of 1859 he opened a private school in Waterbury with quarters on the second floor of the building. He was obliged to discontinue this school eight years after its start, however, because of ill health.

"In 1871 he started an insurance agency in connection with

a real estate business. In 1872 he was appointed librarian of the Bronson Library, which place he held until his resignation because of age and ill health on March 1, 1901. During this long term of service Mr. Bassett became well known to a large part of Waterbury's population. He was happy among the books which he knew and loved. His storehouse of information, acquired with much study and thought, was always at the disposal of those who sought his aid, and although he sometimes seemed stern and unapproachable he was at heart kindly and sympathetic. As a result of his love for natural history the library is the richer by many rare and valuable scientific works brought to the shelves during his administration.

"The Bronson Library has hundreds of standard works on natural history that a less practical librarian would not have thought essential in a manufacturing city. It has three valuable collections: a botanical collection of about 1,500 specimens collected, classified and donated by him; a geological collection of several thousand specimens; the Anderson collections of Indian relics. While he did not pay for the last two, his interest and enthusiasm induced others to.

"He has done even more; he has in his own quiet, earnest way succeeded in making hundreds of men and women believe that their eyes were made to see, that nature was an open book, that they must, to enjoy the full measure of life, be students of nature.

"He believed that there were

Tongues in trees,
Books in the running brooks,
Sermons in stones and good in every thing,

"Mr. Bassett was a rarely developed man. He was a born teacher. He possessed that rare faculty of imparting knowledge to others and of unconsciously teaching men to teach themselves to be studious, to be thoughtful. He was keen and vigorous of intellect. He was tender and true of heart. His counsel, his knowledge, his advice will long be missed in this community."

He acquired an enviable position in American entomology through his studies of galls and gall flies, and wa as pioneer in

this branch of the subject. His writings form most valuable contributions, and he described many species new to science. A short time ago his superb collection of Cynipidæ, including the types, was presented to the American Entomological Society of which he was a corresponding member. This collection is to be kept intact under the name of the Bassett collection. His loss will be keenly felt in the entomological world. He leaves a widow and two daughters.

Notes on Casey's Revision of the American Coccinellidae.

By F. C. Bowditch.

Mr. Casey's change of our well-known *Megilla maculata* D. G. to *fuscilabris* Muls. seems to be doubtful even on his own showing, as he speaks of them "as in all probability distinct." Such changes should only be made on a certainty. *Megilla strenua* from Brownsville, Tex. = *maculata* D. G.; beyond any reasonable question, his *M. medialis* is probably also a synonym (see also Biolog. VII, p. 151). In *Hippodamia* my specimens, which agree with his descriptions of *puncticollis* and *dispar* and come from the same localities, I call 5-*signata* Kby.; several of his other species I fail to identify with certainty, but they seem to be mere variations of established forms.

Eriopsis connexia Germ., he states should be stricken from our lists as not occurring in the United States, though Crotch says it does. I have a specimen from Texas.

Coccinella impressa Casey and *alutacea* Casey = 5-*notata* Kby., or *transversogulta* Fab., whichever of these latter names stands. I fail to separate *perplexa* Muls., *juliana* Muls. and *eugenii* Muls. from our well-known *trifasciata* Linn.; a form of which I have three examples from Colorado and one from Kansas is at present labelled a variety of the last, it has the black part of the thorax continued to the front margin. It is possible this form may tend to *difficilis* Cr.; *C. degener* Casey = 9-*notata*. I think the validity of *C. nevadica* Casey is very dubious, as I have a specimen which shows traces of the spots of 9-*notata*.

Cycloneda immaculata Fabr., *rubripennis* Casey, *limpifer*

Casey, *munda* Say and *polita* Casey. I have many specimens including ones from the exact localities these forms are said to come from, and I confess to a total inability to separate them from *sanguinea* Say (see Biolog. VII, p. 170–71).

Cleis minor and *hudsonica* Casey are varieties of *C. picta* Rand.

I find it impossible to separate my series of *Anatis* 15-*punctata* Oliv. and *mali* Say; the latter is undoubtedly a synonym.

Neomysia interrupta Casey seems the same as *horni* Cr.—my specimens indicate that *randalli* Casey is a variety of *pullata* Say.

I am unable to trace the differences of his new species of *Psyllobora*.

In *Exochomus*, p. 109, speaking of the forms *childreni* to *æthiops*, it is said they may be regarded as derivatives of the *marginipennis* type but specifically distinct. I have the three forms *childreni*, *latiusculus* and *fasciatus*; then I have an example from Yuma, California, which has the elytra of *childreni* and the thorax of *fasciatus*, except that in one the anterior black elytral markings are connected with the posterior, bringing up against specimens of *marginipennis* from St. Louis and Florida.

Chilocorus bivulnerus Muls. is said to occur as far west as Iowa, and there are three new California species. I have examples from California, Oregon and Colorado, which I cannot call anything but *bivulnerus*, and the specimens which I have marked off as the new species seem to be rather shadowy. *Cacti* Linn. is spoken of as from Honduras, but Texan specimens seem plenty. Gorham in Biolog. VII, p. 175, gives California and Texas as localities.

Axion pilatei Muls. is noted as probably distinct from *plagiatum* Lec. because of its red abdomen. I have an example of *pilatei* from Texas which has a red abdomen with a central black cloud. *C.* 3-*pustulatum* D. G. I have from Missouri, Texas, Wisconsin, New Jersey and Pennsylvania.

Brachyacantha illustris Casey = *albifrons* Say; *decora* Casey = *erythrocephala* Muls. I have a pair of this species from Orizaba, Mexico, *in cop.*, which has the "confluent pale spots" entirely separate in the ♂ and confluent in the ♀. I do not find any difference between 10-*pustulata* Mels. and *testudo* Casey or *socialis* Casey and *dentipes* Fab.

Hyperaspis pinguis Casey, I query = *lateralis* Muls. and the same with *lævipennis* Casey ; *wickhami* Casey = *centralis* Muls. ; *globula* Casey extends into Mexico (Vera Cruz) ; 6-*verrucata* Fabr. occurs from Texas, Colorado, Arizona. It seems strange Mr. Casey should have written so elaborate a paper without seeing examples of *tædata*, *pratensis*, etc. I have sundry specimens which do not fit in anywhere, but without a much larger series should hesitate to call them new. Mr. Casey's treatment of the genus seems incomplete and unsatisfactory.

Scymnus—is a wilderness, though I have the benefit of all Mr. Wickham's material, most of which was worked over by Dr. Horn ; I am lost in Mr. Casey's windings—*brunnescens* Casey was apparently thought by Horn to be a variety of *terminatus* Say, *subtropicus* Casey = *collaris* Mels., *Texanus* Casey = *fraternus* Lec., *renoicus* Casey and *calaveras* Casey = *lacustris* Lec.

Lantern Trapping.

By E. J. Smith, Natick, Mass.

For the past two seasons I have been using a moth trap, and had such good luck with it that I would like to tell your readers about it. The trap I used was designed by Mr. A. P. Morse of Wellesley College, who kindly lent it to me. It consists of a box of wood having glass on each of its four sides, and a cover with arrangement for outlet of heat and smoke similar to ordinary old style street lanterns. At the bottom are holes for ingress of air. The box is large enough to contain an ordinary kerosene lamp with chimney, and is supported over a wooden box about 18 inches square, which in turn contains a zinc pan about 2 inches deep, and as large as will go in the box. At the base of each pane of glass is a slot the whole width of the glass and about one inch wide which opens directly into the pan below. The pan is filled about half full of water, and then about a pint of kerosene is poured on top. The moth strikes the glass and falls through the slot and is killed by the oil. I have taken hundreds of moths in a single night, and for many weeks in succession. I let it burn until it goes out, putting enough oil in the lamp to last until towards

morning. In the morning I take a good sized pasteboard box, in the bottom of which is about a dozen thicknesses of old newspaper, and with a slender pair of forceps I pick the moths out by the legs and lay them on the paper. I let them lie there about two hours to get rid of most of the oil and water, then I put them in a large shallow pan of gasoline and cover with a pane of glass and leave for some hours, frequently over night. Then pick them out and lay on blotting paper and the gasoline soon evaporates, leaving the moths as clean and bright as though never wet. The greatest drawback to this method is the "dor bugs" (*Lachnosterna*), which in May and June will swarm into the pan and, of course, damage some of the moths. But in spite of that I have taken many very fine specimens for my cabinet that I never should have seen otherwise. I have used the trap in my orchard about a dozen rods from my door and have taken about 500 different species and varieties. Among them are three species of Deltoids which are, so far as I can learn, not heretofore recorded from this State. They are *Hormisa orciferalis*, *H. litophora* and *Zanclognatha pedipilalis*. I also took *H. bivittata* and *Salia interpunctata*. Besides the above I took *Paonias astylus*, *Hydrœcia speciosissima*, *H. impecuniosa*, *Hyparpax aurora* and *Perophora melsheimerii*, besides others too numerous to mention.

In using the trap care must be taken to add more oil every night, and in the hottest weather the water should be changed twice a week. If in very hot weather a tendency to sliminess appears, it can be prevented by the addition of a spoonful or two of saturated solution of alum in water to the contents of the pan. If too much is added it will form a precipitate, which, however, does no harm. It keeps the water clear much longer than it would otherwise be, but if too strong will corrode the zinc somewhat.

And now a word about the economic side of the question. A firm is advertising a cheap form of trap among farmers and in seed catalogues, and claiming that by using their trap that all insects which are injurious to garden products will be attracted and destroyed, and that it is more effectual and much cheaper than spraying. I think my experience has

fully proved that trapping is worse than useless. I had two traps in my orchard all last season, from March to November, and one the previous season, and last season my apples were so wormy and knotty that I got absolutely no good fruit, while men half a mile away who sprayed got a good crop of fair, fine marketable apples. Great stress is laid on the capture of "coddling" moths in the circulars, meaning, I suppose, *Carpocapsa pomonella*. Although I carefully examined all that I caught, I have a record of only one specimen of that species in the two seasons! Of course, it gets a good many "dor bugs," but I think they are largely males, and at any rate there were more last season than the previous one. It catches also many ant lions, Carabidæ, ichneumons, and species which do not eat anything that is of any use to farmers, and I really think that the destruction of beneficial insects more than balances any good that may be done. But "the fool and his money are soon parted," and farmers are always an easy prey for bunko men and land sharks, so I suppose that many traps will be sold, and many orchards unsprayed in consequence.

I find that the great majority of specimens caught are males, and, of course, as they don't lay eggs, their capture is of no value to the farmer. Of several very common things I have never taken a ♀, though I have carefully examined all, hoping to get specimens for my collection.

The Larvae of Myrmeleon texanus Banks and M. rusticus Hagen.

(See Plate XI.)

J. F. McCLENDON.

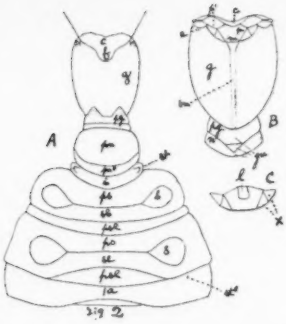
(Contributions from the Zoological Laboratory of the University of Texas, No. 33.)

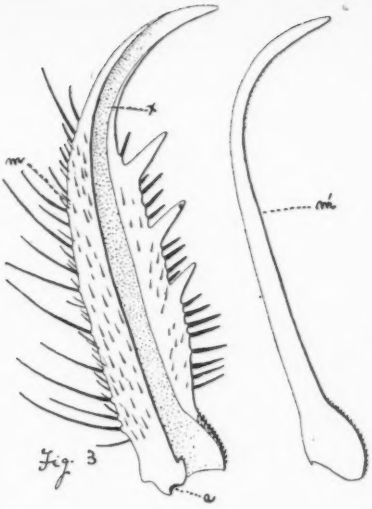
In addition to the technical description of the larvæ of *Myrmeleon texanus* Banks, and *M. rusticus* Hagen, the following paper includes a few paragraphs on the homologies between the external anatomy of the larva and imago. This subject has received some attention from Hagen, Redtenbacher and other entomologists, but their work was of a general nature. In the present paper I have carefully compared the larva with

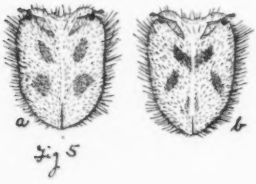
the imago, and with the larvæ and imagines of *Corydalis cornuta* and some other Neuroptera. The two myrmeleon larvæ differ but slightly in form, so that the following description will apply to both.

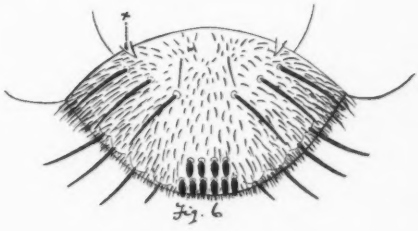
The epicranial suture is obsolete, so the two genæ are fused above (Fig. 2, *g*) but the forked portion remains, and separates the front (Fig. 2, *f*) from the genæ. The suture between the front and the clypeus (Fig. 2, *c*) is obsolete. The middle portion of the clypeus is produced downward in front and meets the palpiger of the labium. The labrum and ligula (Fig. 2, *i*) are small and infolded into the mouth, the two adhering together and closing the oral orifice in front. The eye is represented by a conical peduncle (Fig. 4, *o*) bearing six simple eyes. The antenna (Fig. 4, *a*) arises from the gena, close to the postero-lateral edge of the clypeus. The mandible (Fig. 3, *m*) articulates with the clypeus above and apparently with the gena below; it is grooved beneath, and the maxilla (Fig. 3, m^1), which is devoid of a lacinia, galea or palpus, fits in the groove, the two forming a duct leading to the pharynx. The remainder of the head is more difficult of analysis. Between the head proper and the prothorax there are two segments (Fig. 2, *pg* and *n*). The posterior represents the neck of the imago, the ventral portion being the gula, or a part of it. The dorsal portion of the anterior represents the occiput; and the lateral portions the postgenæ, or rather a part of them, for the postgenæ of the imago extend forward and articulate with the mandibles. The ventral portion of this segment probably represents part of the gula. The genæ are separated below by a narrow strip of thinner chitin, which probably represents the submentum (Fig. 2, *sm*). The mentum is probably represented by a triangular piece (Fig. 2, *m*) partially fused with the palpiger. The palpiger (Fig. 2, *p*) bears, on each side, a lobe (Fig. 2, *c*, *x*) formed of two triangular pieces. The palpus consists of a large flat basal joint (Fig. 2, p^1) and three small joints. The ligula is infolded into the mouth as stated above.

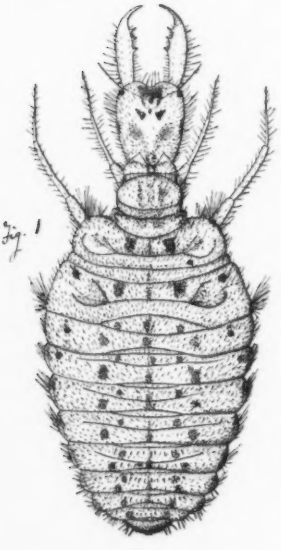
The pronotum is divided transversely into two pieces (Fig. 2, *pn*, pn^1), but these apparently do not represent the scutum











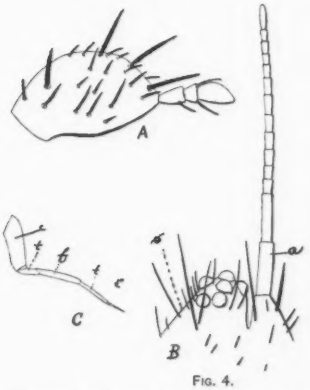


FIG. 4.

LARVÆ OF MYRMELEON TEXANUS BANKS AND M. RUSTICUS HAGEN.

and scutellum. Between the pro- and mesothorax is an intersegmental piece Fig. 2, *i*) which bears the mesothoracic stigmata (Fig. 2, *st*). The metathoracic stigmata are closed. The mesonotum and metanotum are each divided into a prescutum, scutum, scutellum and post-scutellum (Fig. 2, *ps, s, sl, psl*). Each scutum is represented by two widely separated oval pieces. The thoracic pleurites are so modified as to bear little resemblance to those of the imago. Each leg (Fig. 4, *C*) consists of a coxa, trochanter, femur, tibia and tarsus. The coxa has not a meron, this being represented by the elevated portion of the thorax to which the coxa is attached. A comparison of the larva and imago of Corydalis shows how the meron has been separated from the thorax and united to the coxa. The abdomen consists of nine segments, the ninth representing the fusion of the ninth, tenth and eleventh of the insect embryo. The first pair of abdominal stigmata are above (Fig. 2, st^1), the remaining seven pairs are on the midlateral line. The anus, which functions as an opening for the extrusion of the spinneret when the cocoon is woven, is minute, and lies on the upper side of the last segment near the posterior border.

Myrmeleon texanus, Banks.

Larva —Length including mandibles, 12 mm. (my specimens are not apparently full grown). Head somewhat rectangular, suddenly narrowed behind, emarginated in front, thicker behind than in front. Ocular peduncles (Fig. 4, *o*) short, conoid, each with six eyes, three of which are in a row on the end of the peduncle, two more in line behind the middle one of the first three, and the sixth near the outer margin. The antenna (Fig. 4, *a*) reaches the first mandibular tooth, and consists of a variable number of segments, from twelve to fourteen, first segment large, three and one half times as long as broad, second more slender but of about the same length; remainder of antenna tapering toward the tip and composed of short segments; terminal segment as long as preceding two, ending in a small hair. Mandible (Fig. 3, *m*) stout, distal tooth longest, proximal shortest. First joint of palpus (Fig. 4, *A*) a little longer than broad and about twice as long as the three remaining joints together; second joint slender; third about half as long as second; fourth nearly as long as second and third together, pointed at tip, swollen on anterior side. The abdomen varies in size and shape according to condition of the larva. Eighth abdominal segment with a pair of short horn-shaped projections on posterior border below (Fig. 6, *x*). The whole body clothed with stiff hairs. Hair on lateral and anterior margins of head very long; sub-

mentum (Fig. 2, *B*, *sm*) devoid of hair. Hairs on lateral margins of mandibles quite long and stiff; one spine in front of distal mandibular tooth, from two to four spines in each space between consecutive teeth, most often three, least often four. A villosity on each anterior lateral margin of the mesothorax above, inward from which is a smaller one. A villosity on each posterior lateral corner of metathorax above. A row of villosities on each side of the ventral surface of the abdomen, parallel with the margin. Two parallel rows of villosities (or rather tufts of bristles) on each side of abdomen. There is a transverse row of spines on upper surface of last abdominal segment; on the ventral surface a row of spines near the free border each side, the anterior spine longest, each succeeding one shorter; another row of three spines each side, parallel to the preceeding; a pair of smaller spines near the anterior border; a row of six stout cylindrical spines on posterior border, preceded by a row of four similar spines. The larva is yellow with brown spots and markings; all hairs are black. Five spots on dorsal surface of head; one larger spot on anterior border, behind which is a pair of triangular ones, succeeded by a pair of elongate spots reaching from the middle of the head to the posterior border, nearly touching behind, and diverging in front. Two pairs of large spots on ventral surface of head, set far apart; anterior pair narrow, diverging in front; posterior pair larger, nearly circular. Two elongate spots on each side of head, one near the middle, one near posterior border. Ocular peduncles and eyes black. Antenna yellow, shaded into fuscous toward tip. Curved portion of mandible and tips of teeth ferruginous. Terminal segment of palpus brown. The thorax has on upper surface a mid-dorsal broken stripe and two longitudinal rows of spots which diverge behind; thorax is spotted below. The metathorax has a black spot near each anterior lateral border above. The metathorax, coxæ and femurs are sometimes striped longitudinally; all the ungues are fuscous. The abdomen has a mid-dorsal broken stripe, on each side of which are two longitudinal rows of spots curving inwards behind, the inner one of smaller spots; first and second segments each having a black spot near each lateral border above; a mid-ventral row of minute spots, on each side of which are two rows of spots curving inwards behind.

Six specimens from Galveston, Texas, June, 1900.

Myrmeleon rusticus Hagen.

Larva.—Length, including mandibles, 14 mm. Similar to the preceeding (I will describe this larva by comparing it with the preceding). Head slightly variable in shape, generally narrower behind. Antenna of thirteen to fifteen segments. From two to three spines between each two consecutive madibular teeth, more often two. Markings variable in size and shape in individuals of the same locality and to a greater extent in individuals of different localities. Specimens from Laredo, Texas, are not very different from *M. texanus* in marking, while the markings on specimens from Austin, Texas, are larger and darker, being fuscous or black.

Anterior pair of spots on lower surface of head nearly touch on the median line; posterior pair are elongate, wider apart and diverge behind. There are several additional spots on upper side of thorax. There are many additional minute spots on abdomen. In darker specimens the two rows of spots each side of mid-dorsal stripe have united to form a broken stripe.

Habitat.—Texas, New Mexico.

A New Hesperid.

By Henry Skinner.

Pamphila viereckl n. sp.

Male.—Expands 43 mm. Primaries. Upper side. Light grayish brown in color. There are three small sub-apical spots on the costa; an hour-glass shaped spot at the end of the discal cell. This spot may be nearly or quite divided into two by a central constriction. There is a small spot at the origin of the upper median interspace and a larger sub-rectangular spot in the second median interspace. These two in conjunction with the spot in the cell make a triangle. In all but one specimen there is an additional spot above the last median nervure. Secondaries. The color immaculate. Fringes cinereous. The spots of the primaries are white and translucent. Underside. Primaries: Lighter in color with the spots repeated excepting the one near the interior margin. Secondaries: Light gray with a brown line near center of the wing, 5 mm. in length and parallel with marginal curve of the wing.

Female.—Expanse 46 mm. Marked like the male but with the spots larger.

Described from 6 ♂ 2 ♀.

Types in the collection of the Academy of Natural Sciences of Philadelphia.

Taken by Henry L. Viereck in Dry Canon, Alamogordo, New Mexico, May 8th to 13th. Imago feeds on the flowers of *Opuntia*, prickly pear.

This species is allied to *deva*, described by Mr. W. H. Edwards in Trans. Am. Ent. Soc., v, 292, 1876. It is lighter in color above and below than *deva*. *Deva* lacks the spot at the end of the cell. I have seen many specimens of *deva* from South Arizona and have four males and ten females before me at this writing and none have spots at end of discal cell, excepting two females which have a pin-point trace. The two species in question may be separated at a glance by the differ-

ence in color alone. *Deva* is the larger and more robust species of the two. Mr. W. H. Edwards has evidently described *vierecki* in mistake for *deva*, in Papilio ii, 138, 1882. I have a very large series of *deva* in my own collection and one female of *vierecki*, which I have had without a name for many years. The type of *deva* came from Prescott, Arizona, and most of the specimens I have are from Mt. Graham, Arizona. Godman and Salvin, in the Biologia Centrali Americana, Rhop. ii, 492, 1900, erect the genus *Atrytonopsis* for *deva*. What they figure as *A. python* ♀ is *pittacus* ♀. They suggest the possibility of this error.

DR. M. E. HOAG, of Maxwell, Iowa, contemplates making a change in his business affairs, and will be unable to negotiate any new exchanges for the present. Part of his time will probably be spent abroad. Correspondents will please take notice.

"LAST summer I was coming across the meadows this side of Atlantic City N. J., on my wheel, when my attention was attracted by the sound of a cow bell. It had such a strange, unusual sound that I dismounted to investigate, and soon encountered a huge mosquito. She had eaten the cow and was ringing the bell to attract the calf, that she might devour that also."—Referred to the State Entomologist to establish the truth of this.

A MT. AIRY girl sat on the porch steps and watched the fireflies flitting about through the trees. "I wonder if it is true that they get into haymows of barns and set fire to them," she remarked. The other people on the porch laughed with scorn. "Well, I read about it in the paper," said the girl, waxing indignant. "Only yesterday there was a piece that was headed: 'Work of Firebugs,' and then went on to tell how a barn had been set on fire and was totally destroyed." And after this explanation she still continued to wonder why the other people laughed.

Animal Activities.—A First Book in Zoölogy. By Nathaniel S. French, Ph. D. Longmans, Green & Co., 91 Fifth Avenue, New York. This is a work of 262 pages and 205 illustrations. Directions are given for collecting and preserving the material needed for study. An excellent feature is a vocabulary of the terms used at the end of each chapter. The system of questions is also a very valuable means of imparting information when the student is expected to answer them from an examination of the actual specimens. Insects receive considerable attention from the standpoint of anatomy and physiology. We think the work will prove useful as an elementary guide and we can recommend it.—H. S.

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PHILADELPHIA, PA., SEPTEMBER, 1902.

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Entomological Literature.

COMPILED BY H. L. VIERECK AND J. A. G. REHN.

Under the above head it is intended to note papers received at the Academy of Natural Sciences of Philadelphia pertaining to the Entomology of the Americas (North and South). Articles irrelevant to American entomology, unless monographs, will not be noted. Contributions to the anatomy, physiology and embryology of insects, however, whether relating to American or exotic species, will be recorded. The numbers in heavy-faced type refer to the journals, as numbered in the following list, in which the papers are published; * denotes that the paper in question contains descriptions of new North American forms. The titles of all papers will be quoted in the original and not translated.

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1. Proceedings of the Academy of Natural Sciences of Philadelphia, liii.—**2.** Transactions of the American Entomological Society, Philadelphia, xxvii.—**3.** American Naturalist, Cambridge, Mass., xxxvi.—**4.** The Canadian Entomologist, London, Ont., xxxiv.—**5.** Psyche, Cambridge, Mass., ix.—**6.** Journal of the New York Entomological Society, x, No. 2.—**7.** United States Department of Agriculture, Washington.—**9.** The Entomologist, London, xxxv.—**12.** Comptes Rendus l'Academie des Sciences, Paris.—**13.** Comptes Rendus Societe de Biologie, Paris, cxxxiv.—**21.** The Entomologist's Record, London, xiv.—**35.** Annales de Societe Entomologique de Belgique, Brussels, xlv.—**36.** Transactions of the Entomological Society of London, 1902.—**37.** Le Naturaliste Canadien, Chicoutimi, xxix.—**38.** Wiener Entomologische Zeitung, Vienna, xxi, heft v.—**49.** Termeszetrajzi Füzetek, Budapest, xxv.—**50.** Proceedings of the United States National Museum, Washington, xxiv.—**68.** Science, New York, (n. s.) xv.—**75.** Annual Report of the Entomological Society of Ontario, London, 1901.—**79.** Le Nature, Paris.—**97.** Zeitschrift für Wissenschaftliche Zoologie, Leipsig, lxxi, heft 4.—**116.** Biological Bulletin, Boston, iii.—**143.** Ohio Naturalist, Columbus, ii, No. 8.—**148.** Bulletin of the New York State Agricultural Station, Geneva.—**156.** Zeitschrift für Systematische Hymenopterologie und Dipterologie, Teschendorf, ii.—**159.** Allgemeine Zeitschrift für Entomologie, Neudamm, bd. vii.

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Notes and News.

ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE.

ON JUNE 12th we received a NEWS subscription blank and one dollar. The blank lacked name and address. The letter bore post mark New York. Please let us know your name.

MR. CHAS. W. LENG's Revision of the Cicindelidæ of Boreal America (Trans. Am. Ent. Soc.) is out, and reflects great credit on the author. It seems to be a conservative and painstaking piece of work. The typography, etc., is a credit to the editor of the Transactions and the printer.

THERE has been considerable activity in collecting during this Spring and Summer. J. A. G. Rehn and Henry L. Viereck have been at work in the Sacramento Mountains, in New Mexico, on behalf of the Academy of Natural Sciences of Philadelphia. Two hundred birds, mammals and reptiles; five hundred shells; two thousand plants and twenty-five thousand insects were collected.

MR. J. C. BRADLEY is collecting near Dingman's Ferry in Pike County, Penna.

PROF. T. D. A. COCKERELL has done some collecting at Beulah, New Mexico.

MR. H. H. NEWCOMB, of Boston, expected to visit the San Juan country in Southwestern Colorado.

MR. WM. BEUTENMULLER AND DR. E. C. VAN DYKE spent some time collecting near Mt. Mitchell, N. C.

MR. ERNST J. OSLAR has been collecting in Arizona.

PROF. A. J. SNYDER and the Comstock brothers are making a wagon trip across the Rockies in Colorado.

Mr. ERICH DAECKE is constantly adding species to the New Jersey list. His stamping ground is Southern New Jersey.

MR. WARREN KNAUS, of McPherson, Kansas, spent some time at Cloudcroft, Sacramento Mountains, New Mexico.

J. A. G. REHN, G. M. Greene, Chas. T. Greene, W. S. Huntington, and C. W. Fenninger are going to Lehigh Gap, Pa., to collect.

MR. LANCASTER THOMAS is again among the mountains of North Carolina, and he will doubtless add to the list of North Carolina Lepidoptera as usual.

HENRY W. WENZEL and his son, Harry, are trying to exterminate the Coleoptera in the mountains of North Carolina. We are expecting big returns, as both father and son are famous collectors.

MR. O. C. POLING, of Quincy, Illinois, has been exploring the Tonto Basin, about one hundred miles south of Flagstaff, Arizona. Some new and many rare species were captured. He went through a very wild and interesting country, having been gone five weeks.

OTHERS not mentioned are doubtless doing good work, but neglected to advise us of their outings. The people that like to read Notes and News never send us any.

DEPARTMENT OF ECONOMIC ENTOMOLOGY

Edited by Prof. JOHN B. SMITH, Sc. D., New Brunswick, N. J.

Papers for this department are solicited. They should be sent to the editor, Prof. John B. Smith, Sc.D., New Brunswick, N. J.

NOTES ON LIME-SULPHUR-SALT WASH AS AN INSECTICIDE.

By C. W. MALLY.

Agricultural Department, Cape Town, Africa.

The white peach scale, *Diaspis pentagona* Targ., is the most destructive scale pest of peach trees in the Colony. During the last ten years or more lime-sulphur-salt wash has been largely used for its destruction, and well made and thoroughly applied has given satisfactory results.

One peculiarity of the treatment is the fact,—observed by the Government Entomologist, Mr. Charles P. Lounsbury,—that, although the trees were thoroughly sprayed, much live scale could be found for some time afterward, and still at the

close of the season the trees would be quite free from scale. The following questions naturally suggested themselves:

1. Is the effectiveness of the wash due to the percentage of the scales killed at the time of treatment?

2. Does the coating on the trees prevent the successful attachment of the young scales?

3. If it prevents the attachment of the young scales is the entire combination necessary?

In order to get definite information on the points in question, the following tests were made by me, under Mr. Lounsbury's direction, at the Government wine farm, Constantia.

1. Lime-sulphur-salt wash, using 40 pounds of lime.
2. Lime-sulphur-salt wash, using 20 pounds of lime.
3. Lime-salt wash.
4. Lime wash.
5. Lime-sulphur sheep dip; 1 part dip to 5 parts water.
6. Lime-sulphur sheep dip; 1 part dip to 10 parts water.

The washes of the first four tests were prepared on the basis of the following formula: Unslaked lime, 40 punds; sulphur, 20 pounds; stock salt, 15 pounds; water to make 50 imperial gallons. Ten pounds of lime and 20 pounds of sulphur were placed in the cooking kettle with 15 imperial gallons of water boiled until the sulphur was all dissolved. In tests 1 and 2 the remaining lime was slaked, the salt added, and while hot the two mixed with the lime-sulphur solution and the whole boiled for 30 minutes. No analysis was made of this batch of washes, but the lime-sulphur solution of another prepared in exactly the same way and with the same quality of lime, proved to contain lime and sulphur in solution in the ratio of 1 : 1.81. (by volume); another batch made with poorer, long slaked lime, contained a higher proportion of sulphur, namely, 1 : 2.07. It was noticed that, without exception, the proportion of sulphur was decreased by the addition of the extra lime, and that the half hour's hard boiling did not restore the apparent loss; the ratio generally becoming about 1 : 1.60. In tests 3 and 4, lime and salt, and lime alone, respectively, were used in the proportion to water given in the formula for the complete wash. The sheep dip is a concentrated solution of combined lime and sul-

phur prepared for this department for the dipping of sheep under the provisions of the Sheep Scab Act. The analysis of ten drums, including the one used from in the experiments, showed the strength to be nearly uniform and the ratio of lime to sulphur to be about 1 : 2. In test 5 the strength of the wash in terms of the dissolved lime and sulphur was estimated to approximate that of the ordinary lime-sulphur-salt wash, while that used in test 6 was half this strength. It was desirable to test the sheep dip because it is a reliable article, easily procurable at moderate cost and ready for dilution with water.

Large bearing trees in consecutive rows of four trees each were selected for treatment and six similar trees reserved for "controls," making a total of thirty trees under observation.

Duplicate tests were made on the farm of Mr. Henry Myers, at Simondium, near Paarl, about 40 miles from Cape Town, using a large number of trees under a great variety of conditions, three series of four trees each being thoroughly drenched with water one, two and three days after treatment with the hope of getting some idea of the effect of a heavy rain soon after spraying.

Live scale and eggs were abundant on all of the trees, but in some cases at least 50 per cent. of the scales, other than those that had reproduced and died, were already dead, especially on the trunk and larger limbs—an unexplained fact often observed during the winter season in regard to both *Aspidiotus aurantii* Maskell and the species under consideration.

The wash in each case was applied while hot. The lot that was tested registered 155° F. in the tank. Six to eight inches from the nozzle the spray registered 140° F.; about two feet away, only warm; farther away, cold. The advantage in keeping the solution hot is due to the fact that the soluble compounds show a tendency to crystallize when cold, especially if left standing over night. In such case considerable boiling is necessary to redissolve the crystals, otherwise they are apt to be left in the tank. Even though kept in suspension by the constant agitation of the mixture, the crystals will not only lodge on the tree unevenly but will be more easily removed by wind and rain.

The trees at Constantia were sprayed August 13 to 17, 1901, the usual time of application here in order that the treatment may serve for both the scale and the leaf-curl, the fruit buds starting about the first of September, depending on the season.

There was a light rain during the night after tests 1 and 2 were applied, but it had no appreciable effect on the appearance of the trees. The trees in the different tests could be distinguished easily by the color. One and 2 showed a distinct olive tinge, which was not quite so distinct in 1 as in 2 on account of the greater amount of lime. Three and 4 were very white, 3 slightly dull as compared to 4, while 5 and 6 showed only a peculiar light yellowish green tinge with no apparent coating. The lime coating was the coarsest of all and showed the greatest tendency to flake off, leaving considerable patches unprotected. The lime-salt wash was finer grained and adhered better than the lime. The lime-sulphur-salt wash is uniformly fine grained and adheres well, the trees still retaining the characteristic appearance to some extent by January 3, 1902, whereas on the other trees the coating has almost entirely disappeared.

The trees were carefully examined at frequent intervals, and it soon became apparent that in all of the tests only a very small percentage of the insects had been killed,—possibly the imperfectly protected ones,—and that the eggs escaped without injury. Oviposition continued the same as on the untreated trees. In some cases the waxy covering showed a tendency to slough off, leaving the insects exposed. In one instance the unprotected female was ovipositing freely, the eggs lodging in the mass of surrounding scale.

The eggs were hatching freely by October 1st, and it was with no little interest that the progress of the young scale was noted. Thus far, January 4, 1902, none of them have survived on the trees sprayed with lime-sulphur-salt, 1 and 2, nor on the trees sprayed with sheep dip, 5 and 6. On the trees sprayed with lime-salt and lime, the young have settled without any apparent difficulty, showing no appreciable preference for the patches where the lime had scaled off, thus showing that lime-salt and lime have no special preventive value. It should be

noted, however, that the lime, forming a granular coating on the tree, has a tendency to prevent the proper attachment of the waxy covering, thus causing a slight percentage of the young scales to slough off.

On the lime-sulphur-salt and the sheep dip trees the young scales attempt to settle but die *in situ*, and thousands of them can still be seen clinging to the bark, apparently held in place by the mouthparts.

Although the coating on the lime-sulphur-salt trees is much finer than on the lime-salt and lime trees, that is not a satisfactory explanation, because on the trees treated with sheep dip there is no apparent coating and the young scales die in the same way, showing that the soluble compounds form the essential part of the mixture. This is an important practical item here in the Colony,—good quicklime being both expensive and hard to obtain,—for it greatly reduces the cost of the wash as well as the difficulty in application.

The meteorological record shows a total rainfall of 10.145 inches from August 13, 1901 to January 3, 1902, distributed in 45 rains, not counting 4 "trace" records, as follows: August 13th, 0.005; 21st, 0.02; 22d, 0.04; 23d, 0.07; 24th, trace; 25th, 0.22; September 1st, 0.04; 2d, 0.04; 3d, 0.12; 7th, 0.11; 8th, 1.44; 9th, 0.10; 11th, 0.48; 12th, 0.37; 15th, 0.72; 16th, trace; 18th, 0.18; 28th, 0.04; 30th, 0.17; October 1st, 0.35; 4th, 0.75; 5th, 0.02; 6th, 0.14; 20th, 0.07; 21st, 0.01; 24th, trace; 25th, 0.20; 28th, 0.03; 30th, 0.02; 31st, trace; November 4th, 0.04; 5th, 0.13; 9th, 0.76; 10th, 0.07; 18th, 0.57; 19th, 0.63; 20th, 0.29; 21st, 0.11; 28th, 0.02; December 2d, 0.02; 8th, 1.00; 9th, 0.02; 11th, 0.09; 20th, 0.02; 26th, 0.05; 29th, 0.34; 30th, 0.01; January 2, 1902, 4.05; 3d, 0.17.

It will be noticed that the first heavy rain came September 8th, twenty-six days after tests 1 and 2, allowing ample time for the destruction of the old scale, but as stated above, very few seemed to succumb. Its effectiveness is limited to the destruction of the young scales, thousands of which emerged but, as far as can be determined, none of them have survived, although on the control trees the second generation is appear-

ing, January 3, 1902. The only explanation that suggests itself is that the frequent light rains, though they were not heavy enough to remove the soluble compounds, dissolved them sufficiently to destroy the young before these could form the protecting scale. The dead young scales vary considerably in size, suggesting that the larger ones emerged soon after one rain and the smaller ones just before the next.

The weak point in the life history of *Diaspis pentagona* Targ., is the fact that the scale is formed very slowly, for some time consisting simply of long, irregularly matted, waxy filaments easily penetrated under the influence of rain. Whether the young of species like *Aspidiotus aurantii* Maskell and *A. perniciosus* Comstock, which form a dense scale in a few days, can be destroyed in the same way is an interesting point that has not yet been determined.

It is clear, however from Californian experience, that lime-sulphur-salt wash is effectual against *Aspidiotus perniciosus* Comstock in that State. Different experimenters have reported it to fail under the climatic conditions of the Eastern States, but it seems likely that results were looked for too soon and observations discontinued before the wash actually became operative. Even though the results at first may be apparently negative, it seems quite possible that the after effect on the young scales of applications made just before the buds unfold will give results comparing favorably with those attained in the West.

Strangely enough, many of the old scales on the trees treated in the tests described are still alive and ovipositing, the young continuing to emerge but still failing to settle successfully. This great irregularity in development, together with the almost perfect protection by the scale, is the strong point in the life history of the species. On trees thoroughly sprayed with either lime-sulphur-salt wash or sheep dip, the only hope of survival seems to depend on the ability of the old scales to hold out until the rains reduce the soluble compounds of the wash sufficiently to render them harmless to the young.

Owing to martial law regulations it has not been possible to keep full notes on the tests made at Simondium, but the available records are in harmony with the observations made at

Constantia. The thorough drenching of the trees within three days after spraying apparently had no injurious effect.

In Bulletin No. 30, new series, Division of Entomology, U. S. Department of Agriculture, Mr. C. L. Marlatt records an interesting test with lime-sulphur-salt wash, but reports no definite observations after the first heavy rain. It would have been very interesting had the observations been continued several months longer so as to note the effect on the young scales as they emerged. Judging from Mr. Marlatt's statement that "the infested trees, especially those that had been pruned back, made a very vigorous growth, and the fruiting and growth of the others were entirely satisfactory," the young scales were probably destroyed as well, for, if *Diaspis pentagona* Targ. increases in the latitude of Washington as rapidly as it does here at the Cape, with 50 per cent. or more of the scales on the young wood alive, the trees would certainly be badly infested before the next dormant period.

Other similarly infected trees were sprayed at the same time with kerosene emulsion in varying strengths up to one part emulsion to two parts water, but the results were uniformly unsatisfactory. With whale oil soap at the rate of two pounds per imperial gallon, the destruction of the scale was apparently complete without injuring the tree. Weaker strengths, from one-quarter to one pound per imperial gallon, were not effectual in destroying the old scales, but the after effect on the young was similar, though not so marked, to that of the lime-sulphur-salt wash and the sheep dip. A similar after effect has been noticed in treating pear and citrous trees with soft soap, one pound to three imperial gallons of water, for the destruction of *Aspidiotus aurantii* Maskell, the old scales succumbing after a time, leaving the trees quite free.

The observations up to January 4, 1902, indicate:

1. Under South African conditions, neither lime-sulphur-salt wash nor lime-sulphur sheep dip have any marked insecticidal value for *Diaspis pentagona* Targ. after the scale is complete.

2. The young are destroyed soon after emerging, even though three months or more may have elapsed since the application.

3. Lime-sulphur wash, as represented by the lime-sulphur

sheep dip, is thoroughly effectual, making the great amount of lime called for by the formula unnecessary, thus reducing the cost of material as well as the difficulty of application.'

4. Frequent light rains seem to be advantageous for the destruction of the young scales.

5. A coating of lime has little or no value in preventing the attachment of the young scales.

If possible, additional tests will be made during the dry season to determine whether the young scales will be destroyed to the same extent in the absence of rain.

Doings of Societies.

A meeting of the American Entomological Society was held June 26th, Dr. P. P. Calvert, President, in the chair. Fifteen persons were present. Mr. Huntington exhibited some Diptera which had been sent in butterfly papers and had arrived in good condition. Mr. Johnson said he had received *Criorrhina verbosa* from Olympia, Washington. Mr. Huntington had also received it from Vancouver.

Dr. Skinner exhibited specimens of *Cicada septendecim* var. *cassini*.

Mr. Wenzel spoke of finding the chimneys of the periodical *Cicada* at Castle Rock, Pa., and asked if reason for these formations had been discovered.

Mr. Johnson said he had found chimneys in burnt-over land and on low land. The hills nearby did not contain any. It was the sense of the meeting that the adults of this species in question do not feed. Observations had been made to try and discover adults feeding.

Mr. Hornig exhibited a gall found on the stem of a chestnut-oak. The speaker also described the feeding habits and moults of the larva of *Actias luna* which were fed on sour gum.

Dr. Castle spoke of the influence of under-feeding on the determination of sex.

Mr. Laurent exhibited a specimen of *Hemerophila unitaria* taken at Mt. Airy, Philadelphia, at light, on June 22nd. He believed it to be the second record for Pennsylvania.

Mr. J. A. G. Rehn exhibited pictures of the region around Alamogordo, New Mexico.

Dr. Calvert exhibited a male and a female dragonfly from Guatemala, marked as having been taken together, and belonging to an undescribed species of *Protoneura*.* The female has on each side of the dorsal surface of the front part of its mesothorax a two-pronged forked process, directed forward and upward, one prong lying above the other in a vertical plane. The male has the superior appendages at the apex of the abdomen two-branched, the branches lying in a horizontal plane. The inferior appendages are longer than the superior, but unbranched. Comparison of the two sexes suggests that in coitu each superior appendage of the male is received between the two prongs of the mesothoracic process of the female, and in this way a perfect interlocking would be the result. Although we have little exact information, it is usually believed that among the Agrioninæ (to which *Protoneura* belongs) it is the *prothorax* of the female which is clasped by the male. The speaker could not recall any other equally complicated *mesothoracic* structure for copulatory purposes on any of the Odonata, and few females show such a highly developed copulatory structure on any part of the body.

HENRY SKINNER, *Secretary*.

At the May meeting of the Feldman Collecting Social, held at the residence of Mr. H. W. Wenzel, 1523 South Thirteenth Street, fourteen members were present.

Prof. Smith stated that the larvæ which Mr. Johnson gave him sometime ago turned out to be *Stegomyia fasciata*, of which he bred twenty specimens.

Mr. H. Wenzel stated that the egg masses from Anglesea, referred to at the last meeting, turned out to be grasshoppers.

Mr. Boerner stated that at Bellevue, Del., May 11th, he had taken three species of *Dicaelus—dilatatus*, *ambiguus* and *ovalis*, and upon May 18th he had taken *D. dilatatus* and *ovalis* at Arcola, Pa. He reported *Trechus chalybeus* from Westville, N. J.

* This species, for which I propose the name *Protoneura peramans*, will be described at length in the Biologia Centrali-Americana.—P. P. CALVERT.

Dr. Skinner reported that *Cicada septendecim* had been seen at Fairville, Chester County, Penna., on April 19th. This is the earliest record for the appearance of this insect in this locality. Discussed by Messrs. Daecke, Boerner and Skinner.

Prof. Smith said he had noticed *Cicada* cones to be most abundant in burnt over areas and the suggestion had been made that the heat caused them to appear earlier than they would under natural conditions, and finding upon reaching the top that it was too early they would most likely stay in their burrows for a few more days. He also stated that observation seemed to show that the adults do not eat. He spoke about the fungus which is a parasite on the testes of the *Cicada* and in time this seems to rot the abdomen which drops off. This has only been noted upon this one species. Discussed by the members.

Dr. Castle, in speaking about his recent trip to Florida, said that he collected twenty-four days at Enterprise and spent a short time at a number of other places. He secured a very large amount of material which is especially rich in Chrysomelidæ. He also spoke of the manner of collecting in the districts visited.

Dr. Skinner spoke about the insects sent to the Academy of Natural Sciences by Mr. Viereck who is collecting in New Mexico and Texas. Some very rare species have been sent home.

Mr. Laurent exhibited cocoons of *Attacus cecropia*. His specimens seemed to show that the females weave the loose cocoons while the males weave the tight ones.

W. R. REINICK, *Sec'y pro tem.*

A meeting of the Entomological Section of the Academy of Natural Sciences of Philadelphia was held May 22d. Fifteen members were present.

Dr. Calvert exhibited two curious larvæ belonging to the family Syrphidæ, genus *Microdon*. They were found in an ants' nest near Moosehead Lake, Maine. The colors of the specimens had been altered by being kept in alcohol.

Extracts were read from various works which describe these larvæ. Mr. Johnson said he had found pupæ but not larvæ.

Mr. Huntington took exception to a note in the last NEWS in relation to *Sphyracephala brevicornis* by Mr. Houghton. The speaker said he did not doubt that there was skunk cabbage about Ithaca, but re-affirmed his original statement that his specimens were found at least a mile from any skunk cabbage plants.

Mr. Hornig related some interesting experiences in rearing *Actias luna* from the egg.

Dr. Skinner exhibited specimens of *Grapholitha caryana* and their pupæ from hickory husks. The husks were collected by Mr. H. W. Wenzel.

Mr. J. C. Bradley exhibited a net with a flexible ring which was adapted for catching ground insects. He reported great success with it.

The twenty-sixth regular meeting of the Harris Club was held at 35 Court Street, Boston, on the evening of April 8, 1902. Nine members present; President Bolster in the chair.

Mr. Weeks exhibited a pair of the rare and curious *Ornithoptera paradisea*, also varieties of *O. priamus*. Several interesting exhibits of the genus *Plusia* were made by members. Mr. Newcomb spoke briefly of a call on Dr. Otto Siefort, made during a recent trip to Washington, and described some interesting experiments made by the Doctor on the effects of heat and cold on the pupæ of butterflies and moths. Specimens were exhibited showing the effects described.

A. P. HALL, *Sec. pro tem.*

The twenty-seventh regular meeting of the Harris Club was held on the evening of May 13th. President Bolster presided; attendance eighteen. Mr. Field spoke on the colonization of certain districts in New England by southern insects which are extending their ranges northward, and also reviewed Prof. Webster's recent paper on "The Trend of Insect Diffusion in North America." It was voted to begin at once the formation of a Club Library. Mr. Newcomb exhibited a new form of trap-lantern. A committe on Field Meetings was appointed by the chair.

W. L. W. FIELD, *Secretary.*

A regular meeting of the Chicago Entomological Society was held in the John Crerar Library, Thursday evening, May 15th, 1902, at 8 o'clock. Seven members present. W. E. Longley presiding.

It was decided to continue the discussion on spring insects at next meeting.

Mr. Kwiat read a report of the recent acquisitions to the Society's library.

The question of a field day for May 30th was brought up. On motion of Mr. Healy it was decided to meet at Glen Ellyn, and invite the Chicago Mycological to go with us.

On the discussion of spring insects Mr. Kwiat mentioned, among others, the capture of the following Lepidoptera: *Ichthyura albosigma*, on April 27th; *Himella intractata*, on April 28th; *Lemiothisa denticulata*, on April 29th; *Morrisonia evicta* and *vomerina*, on May 2d; *Epirrita 12-linearia*, on May 2d; *Acronycta populi, Arsilonche albovenosa, Gastropacha Americana* and *Biston ursarius* were also taken; all at light.

Lycæna lygdamas (8) and *comyntas, Nisoniades martialis* and *Aspilates coloraria* were taken in field at Palos Park. The first is very rare in this locality.

Prof. Westcott read some notes on early insects and exhibited several specimens, Exhibits were also shown by Mr. Kwiat and Mr. Comstock. JOHN COMSTOCK, *Secretary.*

A regular meeting of the Chicago Entomological Society was held in the John Crerar Library, Thursday, June 19th, 1902, at 8 o'clock, P. M. Seven members were present.

Mr. Frank J. Hall, of Kansas City, was a visitor.

On motion of Mr. Healy, Clarke, Indiana, was selected as the place in which to hold the Fourth of July Field Day.

Informal discussion followed the transaction of regular business, and Messrs. Longley, Healy and Westcott exhibited some of their captures of this year.

It was suggested that the genus *Homoptera* be selected for discussion at the September meeting. Mr. Longley agreed to assume the initiative and lead the discussion.

A. KWIAT, *Sec'y pro tem.*

EXCHANGES.

Not Exceeding Three Lines Free to Subscribers.

☞ These notices are continued as long as our limited space will allow; the new ones are added at the end of the column, and only when necessary those at the top (being longest in) are discontinued.

Identification of Insects (Imagos) for Subscribers.

Specimens will be named under the following conditions: 1st, The number of species to be **limited to twenty-five** for each sending; 2d, the sender to pay all expenses of transportation and the insects to become the property of the American Entomological Society; 3d, Each specimen must have a number attached so that the identification may be announced accordingly; 4th, All insects must be mounted. Exotic species named only by special arrangement with the Editor, who should be consulted before specimens are sent. Send a 2-cent stamp with all insects for return of names. **Please put date of capture and exact locality on each specimen.** Before sending insects for identification, read page 41, Vol. III. Address all packages to ENTOMOLOGICAL NEWS, Academy Natural Sciences, Logan Square, Philadelphia, Pa.

Lepidoptera.—*Argynnis nitocris* var. *nigrocærulea* Ckll., for exchange. Also many other rare butterflies.—Henry Skinner, Acad. Nat. Sciences, 1900 Race Street, Philadelphia.

Exchange.—British Columbia Lepidoptera. Only North American species wanted. Send lists.—Ernest M. Anderson, 64 Superior Street, Victoria, B. C.

Lepidoptera.—I wish to purchase Lepidoptera of North America, especially *Noctuidæ*.—Edouard Brabant, Morenchies Par. Cambria (Nord), France.

Exchange.—Will collect Scydmænidæ and Pselaphidæ in exchange for papers on the families of Scydmænidæ, Pselaphidæ and Staphylinidæ.—August Schmidt, 1836 E. Atlantic St., Philadelphia.

Lepidoptera.—I would like to correspond and exchange with some new beginners.—Charles L. Heink, 4320 North Eleventh St., St. Louis, Mo.

Wanted.—Living larvæ, pupæ, fertile females or eggs of any of the North American *Callimorphæ* (genus *Haploa* Hüb.). Will exchange New Hampshire Lepidoptera.—F. H. Foster, Claremont, N. H.

Dytiscidæ from Florida and other Southern States, from Illinois and Ohio, and from the Northwest, Alaska, British Columbia and Hudson Bay wanted in exchange for cash.—Address John D. Sherman, Jr., 148 East Eighteenth Street, New York City.

Wanted at once.—For cash. One hundred cocoons: *cecropia*, *polyphemus* or *promethea*. L. O. Howard, Division of Entomology, U. S. Dept. of Agriculture. Write before sending.

In Exchange for specimens of equal value, especially *Catocalas*, I offer *C. Blandula*, *Micronympha*, *Alabamæ*, *Olivia*, etc.—Joseph Mattes, 138 East 48 Street, New York City.

Chrysomelidæ Wanted.—Especially *Cryptocephalini*. Undetermined material accepted. Will give good exchange. Frederick Knab, 8 Springfield Street, Chicopee, Mass.

Lepidoptera.—Wanted by purchase or exchange.—B. A. Overbeck, 30 Hill St., Allegheny, Penna.

Wanted.—Cocoons of Cynthia and Luna moths in exchange for cocoons of Promethus and Cecropia.—Harry Russell, 905 Clinton Ave., Bridgeport, Conn.

Arctians.—Living eggs or larvæ of any North American moths of the genus *Arctia* wanted for the purposes of studying preparatory stages. Will be glad to render help, if possible, as to wants of anyone assisting.—Arthur Gibson, Cent. Exp. Farm, Ottawa, Can.

Basswood Insects.—The writer is making a special study of insects injurious to Basswood (*Tilia*). Notes on insects found feeding on this tree will be acceptable.—Arthur Gibson, Cent. Exp. Farm, Ottawa, Can.

Lepidoptera.—Wanted for cash: cocoons of *A. pernyi* and eggs of *A. yama mai* and *A. pernyi*.—R. Ludwig, 513 Empire Bldg., Atlanta, Ga.

Will collect any order in Pennsylvania and New Jersey this season in exchange for Hymenoptera.—J. Chester Bradley, 2221 Spring Garden St., Philadelphia.

Wanted.—Specimens of the genus Homoptera (except *edusa* and *lunata*), from all parts of the United States and Canada, for comparison. Will give other North American Lepidoptera in exchange.—W. E. Longley, 115 South 64th Ave,, Oak Park, Ill.

Lepidoptera.—I would like to correspond and exchange with some new beginners.—Phineas Whiting, 106 Fairmount Street, Lowell, Mass.

Will exchange for Holland's Butterfly book, other literature treating of Lepidoptera, or for desirable specimens of that order, an absolutely new copy of "Howards Insects" See adv. for list of Utah material which I have for exchange.—L. I. Holdredge, Hudson High School, Hudson, N. Y.

Will collect in any order in exchange for Coleoptera, Hemiptera and Lepidoptera.—Charles Stevenson, 906 St. Urbain Street, Montreal, Quebec, Canada.

Exchange Wanted.—Particularly *Cotocalas*. Send list to Jos. H. Reading, 775 North Rockwell Street, Chicago.

Plusias Wanted.—Having just described a dozen new species of *Plusias*, all represented by females, I will pay liberally for males of any of the same, or for any *Plusias* of which I have short series. Correspondence solicited.—R. Ottolengui, 80 W. 40th St., N. Y. City.

Wanted.—"Classification of the Coleoptera of North America," by LeConte and Horn; will give cash or exchange for Volume in good condition —M. E. Hoag, D.D.S., Maxwell, Iowa.

Coleoptera —Twenty-five California species of Cleridæ, Buprestidæ and Malachidæ, in sets of four, for species in the same families not in my collection.—Ralph Hopping, Redstone Park, Kaweah, Tulare Co., California.

Lepidoptera.—N. A. Lepidoptera desired, Those willing to collect, in exchange for European specimens. please communicate with James McDunnough, Kleist Str. 42, Berlin, Germany.

For Exchange.—Butterflies of Southwestern Ohio, including *F. henrici* and *B. ajax*. All specimens perfect and fresh. Send lists. Annette F. Braun, 2702 May St., Cincinnati, Ohio.

Argynnids Wanted —*Arg. electa, atlantis, leto, cypris* and *aphrodite*. Have numerous duplicates, especially *noctuiidæ*. F. H. Walley Dad, Millarsville, Alta, N. W. T, Canada.

Lepidoptera.—Superb examples of *Hemileuca tricolor, Catocala chelidonia, babayaga, Pam. python, Apatura leila* and other extreme rarities in exchange for species of equal interest. O. C. Poling, Quincy, Ills.

Cocoons of *Samia Cecropia* to exchange for cocoons of other Lepidoptera. Mrs. J. M. McNamar, 2020 Franklin Avenue, Toledo, Ohio.

I will make collections in the Mississippi Valley of Diurnal Lepidoptera in exchange for specimens of other localities. C. H. Ross, Burlington, Iowa.

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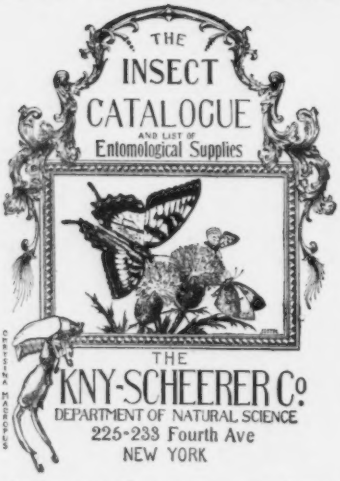

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